

Application Serial No. 10/701,326
Reply to office action of December 23, 2005

PATENT
Docket: CU-3430

REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

Claims 1-11 are pending before this amendment. By the present amendment, claims 1-3 are canceled without prejudice; claims 4-8 are amended; and new claims 9-11 are added. No new matter has been added.

In the office action (page 2), claim 8 stands rejected under 35 U.S.C. § 112, as being indefinite.

In response, the applicants have amended claim 8 to remove "a relatively small thickness" and replace it with —a thickness that is less than the thickness of the portion of the down-set leadframe adjacent to the tip—. The applicants respectfully submit that this removes the indefiniteness of the claim, and therefore request withdrawal of the rejection.

In the office action (page 3), claims 1, 2, 3, 6 and 8 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Publication No. 2002/0153599 (Chang) in view of U.S. Publication No. 2003/0011052 (Kim). The "et al." suffix is omitted in a reference name.

Also, in the office action (page 6), claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The applicants thank the examiner for the indication of allowable subject matter. For the purpose of expediting the prosecution of this application, the applicants have

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amended each of claim 4 and claim 5 to include the limitations of base claim 1 and intervening claim 3, and the applicants have cancelled claims 1- 3. The applicants have also amended claim 6 so that Claim 6 now depends from claim 4 (indicated as containing allowable subject matter). Claim 2 has been rewritten as new claims 9-10 depending from Claim 4 and Claim 5, respectively.

The applicants respectfully note on record that the amendment of claims herein should not be construed as an admission by the applicants that any of the cited prior art references teaches or discloses or suggests any of the claimed subject matter in the manner proposed by the examiner. In this regard, the applicants respectfully reserve all rights to present the subject matter of the claims 1-3, now cancelled, in a separate patent application continuing from this application or otherwise.

As to claim 8, as described above, claim 8 has been amended to remove any indefiniteness. The applicants respectfully submit that neither Chang nor Kim, alone or in combination, teaches or suggests the present invention of claim 8 as amended.

The amended claim 8 recites, inter alia:

--a down-set leadframe having a tip to be wire-bonded, the tip being designed in such a manner as to have a thickness that is less than the thickness of the portion of the down-set leadframe adjacent to the tip--

Support for this amendment can be found at least in FIG. 6 (FIG. 6 clearly shows the tip, and the tip has a thickness less than the adjacent portion of the down-set leadframe 24) and in the specification page page 10, lines 12-16.

In the office action (page 4) the examiner cites Chang, and the examiner states that Chang includes a tip being designed in such a manner as to have a relatively small

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thickness.

The applicants have clarified this language in claim 8, so that it is clear that the tip of the presently claimed invention has a thickness less than that of the adjacent portion of the leadframe. For example, in the present invention, the inner lead tip of the leadframe can be half-etched or coined so that it has a small thickness relative to the adjacent portion of the leadframe 24 (specification page 10, lines 12-16; FIG. 6). This can be helpful when forming the metal lines 25 shown in FIG. 4.

Chang fails to teach this element of the present invention, since Chang shows only an LOC lead frame having a constant thickness. Thus, the tip of Chang's lead frame does **not** have tip with a thickness that is less than the thickness of the portion adjacent to the tip.

None of the remaining cited prior art references (either alone or in combination with Chang) teaches this element of the present invention of claim 8. Therefore, an indication of allowable subject matter with respect to claim 8 is respectfully requested.

In the office action (page 5), claim 7 stands rejected under 35 U.S.C. § 103(a) as being obvious over Chang in view Kim, and further in view of in view of U.S. Publication No. 2004/0065945 (Smith). The "et al." suffix is omitted in a reference name.

As to claim 7, in the present invention, a B-stage material 31 (see, e.g., FIG. 4) can be applied to the first semiconductor chip, and then the first semiconductor chip can be attached to the leadframe 24 by the B-stage material 31 (page 10, lines 4-11; FIG. 4). Thus, as explained and as is shown in FIG. 4., the B-stage material 31 is interposed between the leadframe 24 and the first semiconductor chip 21. Claim 7 has been

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amended to clarify this aspect of the present invention, and now recites, inter alia:

—a first semiconductor chip attached under the leadframe by means of a B-stage material interposed between the leadframe and the first semiconductor chip—

The applicants respectfully submit that none of Chang, Kim, and Smith, whether they are considered individually or in combination, teaches or suggests the present invention of claim 7.

In the office action (page 6), the examiner concedes that Change does not disclose "by means of a B-stage material" and points to Smith for the missing subject matter. However, the applicants respectfully submit that Smith does not teach that the B-stage material is —interposed between the leadframe and the first semiconductor chip—.

In contrast, Smith discloses that **Adhesive members 38** (not the molded inner member 42) attach the face of the die 32 to the underside of the lead fingers 30 (Smith, [0042] on page 3). Thus, the only thing interposed between the lead fingers 30 and the die 32 is the adhesive members 38 and not the molded inner member 42. In Smith, the molded inner member 42 provides additional strength and rigidity for the package (Smith [0043] on page 3), and in Smith the molded inner member 42 encapsulates the die 32. However, the molded inner member 42 is **not** interposed between the die 32 and the lead fingers 30, since the adhesive members 38 are instead in place.

In the presently claimed invention, the B-stage material can be used for attaching the semiconductor chip 21 to the leadframe 24, so that an expensive LOC tape is not used (specification page 10, lines 4-11). Smith, on the other hand, simply uses the molded inner member for additional strength and rigidity (Smith [0043] on page 3), and

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the adhesive members 38 instead attach the face of the die 32 to the underside of the lead fingers 30 (Smith [0032]); and thus, in Smith the molded inner member is not interposed between the lead fingers 30 and the die 32.

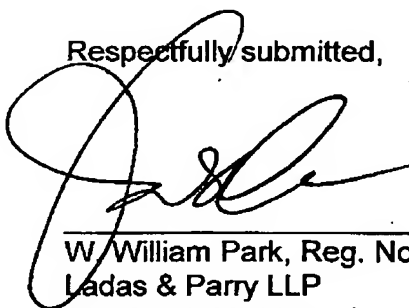
Accordingly, none of Chang, Kim, and Smith, considered individually or in combination, teaches or suggests the present invention of claim 7. An indication of allowable subject matter with respect to claim 7 is respectfully requested.

For the reasons set forth above, the applicants respectfully submit that claims 4-10, now pending in this application, are in condition for allowance over the cited references. Accordingly, the applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit an indication of allowable subject matter.

This amendment is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns, the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

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Respectfully submitted,



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